REMARKS

Status of the Claims

Claims 1 – 17, 19 – 35 and 39 – 78 are pending. Claims 1 – 17 and 19 – 32 have been previously withdrawn and claims 76 – 78 were withdrawn by the Examiner in the most recent Office Action. Claims 33 – 35 and 39 – 75 were examined in the most recent Office Action.

Rejection under 35 U.S.C. § 103(a) based on Holland and Shinoda

Claims 33, 34, 39 – 45, 51 – 53, 55 – 60 and 66 – 69 stand rejected under 35 U.S.C. 103(a) as allegedly obvious over U.S. Patent No. 5,468,575 to Holland, *et al.* (hereinafter "Holland") in view of U.S. Patent No. 5,376,480 to Shinoda, *et al.* (hereinafter "Shinoda"). Applicants respectfully traverses this rejection.

Holland describes a lead-acid battery with a fibrous web positioned in the free spaces of the battery which temporarily absorbs the "changing free electrolytic volume" of the battery (see col. 3, lines 18 – 28). As explained by Holland, this additional liquid electrolyte "sponge" ensures that the battery can be operated in the upright or horizontal positions (see Abstract and col. 2, lines 41 – 66). The Examiner acknowledges that Holland does not teach using a fibrous material in fiber form and cites Shinoda as a secondary reference for that purpose ("[…] Shinoda, which deals with battery production, teaches that fibers can be disposed in the battery electrolyte to improve the impact resistance of the battery", see page 4 of Office Action). According to the Examiner, the teachings of Shinoda would have motivated a person of ordinary skill in the art to replace the fibrous web of Holland with a fibrous material in fiber form because "Shinoda teaches that to do so improves the durability of the battery while also acting as an electrolyte absorbent" (see page 4 of Office Action).

Applicants respectfully disagree and submit that a person of ordinary skill in the art would have had no reason to modify Holland based on the teachings of Shinoda, let alone a reason to replace the fibrous web of Holland with a fibrous material in fiber form.

First, Shinoda is directed to alkaline batteries, not the lead-acid batteries of Holland. As would be immediately apparent to a person of ordinary skill in the art, the chemical and physical design of alkaline and lead-acid batteries are completely different. Thus, as described in col. 2,

lines 1 – 9 of Shinoda, conventional alkaline batteries use "gel form negative electrodes" which are "typically formed by mixing and kneading zinc powder, alkaline electrolyte and a gelling agent." This gel form negative electrode is shown as component **4** in Figure 4 of Shinoda and is separated from the "positive pole composition" **1** by a separator **3** (see col. 7, lines 53 – 59). The positive pole composition is made of manganese oxide and graphite (see col. 7, lines 55 – 57). Shinoda explains that a small amount of mercury was traditionally added in order to protect the integrity of the gel form negative electrode (e.g., in response to an impact caused by the battery being dropped, see col. 2, lines 19 – 32). Mercury is undesirable and Shinoda therefore teaches an alternative approach whereby a "fiber material is added to the gel form negative electrode of the alkaline battery" instead of the mercury (see col. 3, line 32 to col. 4, line 11). In contrast, lead-acid batteries such as those taught by Holland use spongy or porous lead plates as the negative electrode. Lead oxide plates form the positive electrode and are separated from the negative lead plates by a separator (e.g., see Figure 1 of Holland and col. 3, lines 51 – 54: "[t]he positive electrode plates are referred to as **2**, the negative electrode plates above are referred to as **3**, the separators positioned in between are referred to as **4**"). The electrolyte is located between and within the positive and negative electrodes. In light of these significant structural and chemical differences, Applicants respectfully submit that it would have been highly unusual for a person of ordinary skill in the art to modify the design of a lead-acid battery based on teachings that were specifically made in the context of the non-analogous alkaline batteries. This is particularly so when the alkaline battery teachings were made in the context of a component (gel formed negative electrode of Shinoda) which is physically, chemically and functionally completely different from the component being modified (fibrous web of Holland).

Second, even if the skilled person had considered the teachings of Shinoda and how they might be applied to modify the lead-acid battery of Holland, Applicants fail to see why he or she would have been motivated to replace the fibrous web of Holland with a fibrous material in fiber form. The Examiner refers to improved durability; however, neither reference provides any reason to believe that fibers in fiber from would improve durability as compared to the fibrous web of Holland. In fact, it is entirely possible that replacing the fibrous web with fibers in fiber form would actually impair the durability of the lead-acid battery of Holland. Besides, the

mechanical structure (i.e., cases, components, materials of construction, etc.) and uses of the two types of batteries are very different. The other reason that Shinoda provides for adding fibers to his batteries (namely avoiding the use of mercury) is wholly inapplicable to the lead-acid batteries of Holland because mercury is not present.

For these reasons, Applicants respectfully request that the Examiner reconsider and withdrawn the rejection of claims 33, 34, 39 – 45, 51 – 53, 55 – 60 and 66 – 69 based on the combined teachings of Holland and Shinoda.

Other rejections under 35 U.S.C. § 103(a)

The remaining claims (i.e., claims 35, 46 – 50, 54, 61 – 65 and 70 – 75) are rejected under 35 U.S.C. § 103(a) based upon four different combinations of references. All of these combinations rely on the base combination of Holland and Shinoda. Thus, Holland and Shinoda are combined with U.S. Patent No. 6,150,056 to Ingaki, *et al.* (hereinafter "Ingaki"), U.S. Patent Application Publication No. 2003/0182972 to Reher, *et al.* (hereinafter "Reher"), U.S. Patent No. 6,306,539 to Zguris (hereinafter "Zguris") or U.S. Patent No. 6,227,009 to Cusick *et al.*, (hereinafter "Cusick"). These secondary references are cited for the sole purpose of allegedly teaching limitations that are found in these dependent claims (e.g., chemical nature of electrolyte, chemical nature and physical dimensions of fibers).

Rejected claims 35, 46 – 50, 54, 61 – 65 and 70 – 75 all depend from independent claim 33, 51, 66, 67 or 69. These independent claims were all rejected over the base combination of Holland and Shinoda. As discussed above, the base combination of Holland and Shinoda fails to render these independent claims obvious. Applicants submit that the additional references (Ingaki, Reher, Zguris and Cusick) which were cited for limitations found in the dependent claims do not cure the deficiencies of the combination of Holland and Shinoda. Applicants therefore respectfully submit that claims 35, 46 – 50, 54, 61 – 65 and 70 – 75 are also allowable over the cited art.

Conclusion

Applicants would like to thank the Examiner for his time and consideration of this case. If a telephone conversation would help clarify any issues, or help expedite prosecution of, this case, Applicants invite the Examiner to contact the undersigned at (617) 248-5222. Additionally, please charge any fees that may be required or credit any overpayment to our Deposit Account 03-1721.

Respectfully Submitted,
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